Due to the clinical and metabolic implications of such a diagnosis, and for research purposes, diagnosis in earlier age may be beneficial. We tried to identify factors, in clinical practice, that might be useful to increase the index of suspicion for this disorder, in a relatively young age.
Methods: From our cohort of 140 patients with DISH, we identified 18 patients (12.8%) who were diagnosed before the age of 50 years (group A). This group was compared to 20 patients of similar age with osteoarthritis (group B), and 24 patients with DISH diagnosed after the age of 60 years (group C). All the patients with DISH met the Resnick classification criteria, and all OA patients did not have radiological findings suggestive of DISH. Data collection included demographic characteristics, body region of main complaint (ie upper or lower limbs, cervical, thoracic, or lumbar spine, chest, hips and shoulders girdle), clinical or radiographic evidence for enthesopathies or tendonitis, length of follow-up, BMI, serum lipid profile, family history of diabetes mellitus (DM), hypertension (HTS), and gout. The presence of ischemic heart disease (IHD), cerebral vascular disease (CVD), DM, and HTS, were recorded at presentation and during the follow-up period. The use of blood pressure lowering agents, anti diabetic medications, lipid lowering agents, aspirin or other antiplatelet medications, allopurinol, and anti anginal medications were also recorded at presentation and during the follow-up period.
Results: Gender distribution was similar in all groups. The mean age at presentation for groups A, B, and C was 45, 50 and 69 years respectively, and the mean follow-up was 6.6, 7.9, and 4.3 years respectively. Patients in group A compared to group B, had statistically significant more pain in the lumbar and thoracic spine ($p = 0.001$ and 0.016 respectively), and were more likely to be obese (BMI $\geqslant 30$, $p = 0.014$). They were also more likely to have a first degree relative with HTS and DM ($p = 0.015$ and 0.05 respectively). Enthesopathies and/or tendonitis were significantly more common in group A ($p = 0.028$). Patients in group A were more likely to have DM and were more often prescribed anti diabetic medications during follow-up, although these did not reach statistical significance. No statistical differences were observed for any of the investigated items between group A and group C except for a significantly higher occurrence of HTS in group C.
Conclusions: Individuals in their fifth decade of life are likely to be affected by DISH if they are obese, have a first degree relative with either HTS or DM, complain of lumbar or thoracic spinal pain, and are affected by enthesopathies or tendonitis. These individuals have a tendency to have or develop DM. The variables examined in this study, in patients with DISH, did not differ between the age groups.

287 CORRELATION BETWEEN POSTURAL BALANCE, MUSCLE STRENGTH, PAIN AND HIP FUNCTION IN PATIENTS WITH OSTEOARTHRITIS BEFORE AND AFTER TOTAL HIP ARTHROPLASTY: A PROSPECTIVE CONTROLLED FOLLOW-UP STUDY

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Purpose: Improvement of postural stability is one of the most important rehabilitative goals to prevent falling and consequent loosening or dislocation of the prosthesis in patients with total hip arthroplasty (THA). Some of the previous studies revealed that despite capsulectomy, no significant loss was observed in proprioceptive sense in THA patients. However, balance deficits and abductor muscle weakness generally persisted. The aims of this study were (1) to compare the postural balance and lower extremity muscle strength in THA patients with healthy subjects and (2) to evaluate the factors – aside from proprioception – related to postural stability in patients with hip osteoarthiritis, before and after THA.
Methods: A total of 20 THA patients and 20 age-and sex- matched healthy controls were included in this prospective controlled follow-up study. Balance and related parameters were evaluated before THA and then 6 weeks, three months and six months postoperatively. Balance was examined using stabilometry. Muscle strength (maximal volunter contraction) of the lower extremity was measured with strain gauge myometer. Other parameters analysed as possible causes of balance impairment were; range of motion, leg length discrepancy, pain intensity and Harris Hip Score. All of the patients were given supervised postoperative physiotherapy during their hospitalization. They were also given a home exercise program at the time of discharge. Data were evaluated using Spearman correlation analysis, and t tests.
Results: Compared to the healthy controls, patients with THA showed significant balance deficit at all measurements ($p < 0.05$). No statistically significant difference was found between the preoperative and follow-up balance index scores in the THA group ($p > 0.05$). Some of the big muscles – especially the hip abductors – of the lower extremities were found to be significantly weaker in osteoarthritic hips (preoperatively) than that of their contralateral legs ($p < 0.05$) and also than that of control subjects ($p < 0.05$). At six weeks after THA, significant deficits were observed in muscle strength as compared to preoperative values ($p < 0.05$). These muscles became significantly stronger than preoperative levels at the end of the third and sixth months but especially hip abductors remaied weaker than that of controls. Significant correlations were found between the strength of hip and knee flexor muscles and balance index score ($r = -0.577$; $r = -0.641$) at postoperative three months and also between the knee extensor muscle strength and balance index score ($r = -0.566$) at six months. Patients with stronger muscles had better postural stability. In the THA group, Harris Hip Score was correlated with the balance index score ($r = -0.877$) at three months follow-up. No correlation was found between the balance and other variables.
Conclusions: As muscle strength and hip function was found to be a strong predictor of better balance performance, rehabilitation programs that focus on strengthening of the hip muscles as well as postural control and proprioception exercises can improve the balance of these patients and prolong survival after prosthesis.

288 HAND OSTEOARTHRITIS IN OLDER WOMEN IS ASSOCIATED WITH CAROTID AND CORONARY ATHEROSCLEROSIS: THE AGES-REYKJAVIK STUDY

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Purpose: There is some evidence that atherosclerosis may contribute to the initiation or progression of osteoarthritis (OA). To test this hypothesis, we compared the presence and severity of hand osteoarthritis (HOA), scored from photographs, with markers of atherosclerotic vascular disease in an elderly population.
Methods: The AGES-Reykjavik Study is a population-based multidisciplinary study of aging in the elderly population of Reykjavik. The participants were 2264 males, mean age 76 ± 6, and 3078 females, mean age 76 ± 6. Evidence of HOA was recorded from high quality digital photographs and given a global score of 0–4 based on the number and the severity of affected DIP, PIP and CMC1 joints. The measures of atherosclerosis included carotid intimal thickness and plaque severity by ultrasound, coronary and aortic calcifications by computed tomography, and reported cardiac and cerebrovascular events for association.
Results: After adjustment for confounders including age and smoking, both carotid plaque severity (CPs), and coronary calcifications (CAC), were significantly associated with the presence of HOA in females with an odds ratio of 1.42 (1.14–1.76, $p = 0.0016$) for having coronary calcifications, and 1.25 (1.04–1.49, $p = 0.0159$) for having moderate or severe carotid plaques. Both CPs (Moderate or severe) and CAC (presence/absence) also exhibited significant linear trends in relation to HOA severity in females ($p = 0.00002$ and $p = 0.027$ respectively for trend). No significant associations were seen in males. Despite this evidence of increased atherosclerosis, females with HOA did not report proportionally more previous cardiovascular or cerebrovascular events.
Conclusions: These results indicate a linear relationship between the severity of HOA and atherosclerosis in older females. Thus, the pathological process of HOA seems to have some components in common with atherosclerosis. Prospective studies may help clarifying the mechanisms of this relationship.

289 MAGNITUDE OF THE SYMPTOMATIC AT 3, 6 AND 12 MONTHS AFTER TOTAL ARTICULAR REPLACEMENT IN HIP AND KNEE OSTEOARTHRITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Purpose: Despite the fact that Total Articulation Replacement (TAR) is proposed as the optimal therapy in advanced disease Osteoarthritis (OA),

the relative efficacy of such treatment with the OA localization (e.g. hip versus knee) is still debated.
Objective: Compare the magnitude of the effect on pain and function at 3, 6 and 12 months after TAR with regard to the OA localization (hip vs knee).
Methods: Bibliographic search: A systematic review was undertaken with the keywords "total hip replacement" (THR), "total hip arthroplasty", "total knee replacement" (TKR), "total knee arthroplasty", "pain", "disability", "functional capacity", "function" or "osteoarthritis", in PUBMED, the Cochrane Library and EMBASE, in January 2008, in humans, published after 1987 in English, French or Spanish.
Data collection: Pain and function before and after THR or TKR, assessed by visual analogue scale (VAS), WOMAC sub-scales or Lequesne's index. Cohen's effect size was calculated. Random meta-analysis was performed with pooled effect size, using the Mantel-Haenszel method with a continuity correction.
Results: The literature search identified 277 citations for hip and 328 for knee. A total of 27 clinical trials met the inclusion criteria (11 for hip, 12 for knee and 4 for both). The studies were published from 1995 through 2007. Total number of patients was 6244 (2520 for hip and 3724 for knee), median age 68.4 (range 59.0−71.8) for hip and 68.4 (range 62.0−82.9) for knee, 53.9% were female for hip and 62.2% for knee. The follow-up period varied between studies (1 week to 3 years), as did the time point at which outcomes were assessed.

	Hip				Knee			
	No. of studies	No. of patients	Effect size	95% CI	No. of studies	No. of patients	Effect size	95% CI
Pain								
Total	15	2520	2.12	1.91−2.30	16	3724	1.50	1.27−1.73
3 months	6	606	2.21	1.61−2.80	8	1532	1.01	0.72−1.31
6 months	6	571	2.26	1.86−2.66	12	2025	1.79	1.59−1.99
12 months	9	1676	2.03	1.78−2.28	7	2166	1.64	1.09−2.19
Function								
Total	12	2146	2.10	1.96−2.24	15	3618	1.36	1.14−1.80
3 months	5	505	1.89	1.45−2.33	7	1300	0.96	0.67−1.26
6 months	6	656	2.10	1.90−2.30	11	1909	1.68	1.48−1.89
12 months	6	1423	2.21	2.03−2.40	6	2050	1.35	0.83−1.86

Conclusions: This meta-analysis confirms the high clinical interest of both THR and TKR in the treatment of advanced hip or knee OA and suggests that such symptomatic affect is achieved more rapidly and is of greater magnitude in hip versus knee OA.

290 THE EFFECTS OF PROPRIOCEPTIVE OR STRENGTH TRAINING ON THE NEUROMUSCULAR FUNCTION IN PATIENTS WITH OSTEOARTHRITIC KNEE: A RANDOMIZED CLINICAL TRIAL

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Purpose: Several studies have shown that patients with osteoarthritis (OA) have an improved proprioceptive function compared to subjects with knee problems. The measurement of functional scores and proprioception potentially provides clinicians with more information on the status of the OA knees. The purpose of this study was to determine the proprioceptive skills after proprioceptive training program (PTP) versus a strength training program (STP) on neuromuscular function in patients with knee osteoarthritis (OA).
Methods: Forty patients with knee OA (age range: 49−62 years-old) were randomly assigned to one of the following 4-week training programs: Group 1: Neuromuscular STP with neuromuscular electrical stimulation (n = 20), and group 2: PTP (n = 20). The outcome measures were: (1) peak torque time of the isokinetic quadriceps muscles (ISOMED 2000), (2) timed up and go test for function, (3) visual analogue scale for pain intensity, (4) subjective score-Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) for functional performance measurement. To evaluate proprioception in patients with OA, we used the angle reproduction in the lying position on Functional Squat System (Monitored Rehab Systems).
Results: Patients in both groups demonstrated similar significant gains in functional ability, pain intensity, subjective score, isokinetic quadriceps strength and proprioception scores ($p < 0.05$). There was a significant difference in the active reproduction test between both groups in the active lying position ($p < 0.05$). The PT group demonstrated greater percent change in isokinetic torques than STP at the end of the 4 weeks ($p < 0.05$). Quadriceps strength is a determinant of functional ability for the affected knees.
Conclusions: Both training programs influenced pain intensity and isokinetic strength of the quadriceps. PTP alone can induce isokinetic strength gains also. Overall, the functional and proprioceptive outcomes demonstrate results to recommend the procedure. Restoring and increasing quadriceps strength of the affected knees is essential to maximize the functional ability of the osteoarthritic knee. A longitudinal study with a larger sample size is needed to confirm the potential use of proprioceptive training for patients with knee OA.

291 CAN VIBRATION ANALYSIS BE USED TO EVALUATE KNEE OSTEOARTHRITIS?

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Purpose: The purpose of this research was to investigate the possibility of using vibration analysis to detect and assess the extent of osteoarthritis (OA) in the knee. We also examined the correlation between vibration analysis and MRI detected features.
Methods: 80 patients from healthy to severe, were recruited from local rheumatology clinics. For each patient MRI and vibration recordings were made on both knees. MRI images were analyzed by a radiologist and different symptoms related to osteoarthritis in the knee were scored for each subject's knee using a validated MRI scoring standard ("KABON"). Vibration signals of the patients' knees were recorded using 5 accelerometers placed at different locations on the knee during a squatting motion. In order to be able to simultaneously record vibration signals from various knee locations with minimum interference, we designed and developed a brace which would allow the required motion with minimum mechanical and noise interference with data acquisition (Fig. 1).

Figure 1. Brace used for collecting vibration data from subjects' knees

Analysis: We used principal component analysis (PCA) and partial least squares (PLS), multivariable, latent space analysis/regression techniques to statistically process the data, yielding classification plots. These techniques have superior performance compared to ordinary multivariable regression and classification techniques when dealing with large numbers of correlated variables.
We used PCA and PLS to assess the correlation between the vibration signals generated by the motion in the knee and the rheumatologist's diagnosis as well as the MRI features recorded earlier.
Results: Figure 2 shows a scatter plot of the PCA classifier. In this type of classification a hyper plane (line in two dimensional space) separates two classes of observations; one is the group of patients with physician diagnosed knee osteoarthritis and the other is the control group which does not. For this system of classification the sensitivity was 86% and the specificity was 74%. the positive and negative predictive values were 77% and 84% respectively. The accuracy was 84%.
Correlation with MRI features: We found a strong correlation between vibration results and some of the features identified by MRI scanning such as osteophyte formation and cartilage degeneration of the knee. Our results show that our recorded vibration signals are the result of osteophyte formation, catilage degeneration and meniscus damage/degeneration. We did not find any strong correlation between the vibration signals and other osteoarthritis symptoms such changes of bone features like bone marrow edema and subcondral cyst.
Conclusions: The development of knee OA is accompanied by changes in the quality and loss of cartilage, formation of osteophyte and a lowering